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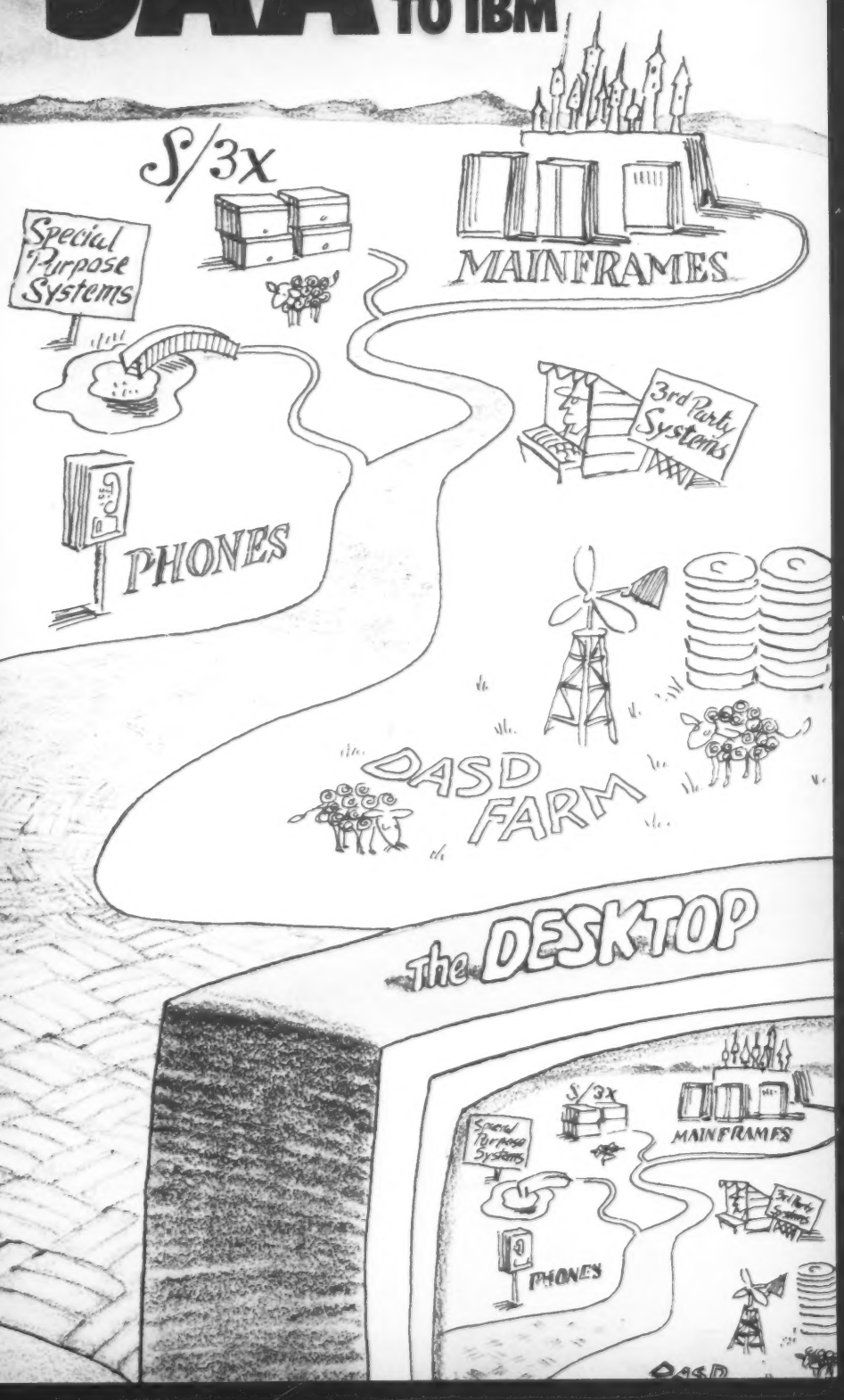
June 1987

DECISIONS

Computer & Communications

SPECIAL REPORT

SAA THE WORLD ACCORDING TO IBM



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Computer & Communications
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Special Report

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OUR SURVEY OF

Results of the initial DECISIONS/Paine Webber Survey indicate MIS spending may be ready to rise, and point to the vendors who will benefit most.

by John Rymer

Can DEC do no wrong? Will IBM do anything right? Respondents to the *Computer & Communications* DECISIONS/Paine Webber Survey of MIS Attitudes currently have a high regard for Digital Equipment Corp. as a vendor, even though about half of them hail from IBM shops. They have been somewhat down on IBM, compared to DEC, but their opinions may soon change for the better, the survey also shows.

The responses of the 1,240 MIS executives and managers who answered our survey shed considerable light on the ongoing contest between IBM and DEC, which has reached a critical juncture. Having established its credentials in networking, DEC is challenging IBM's dominance in corporate data centers. Meanwhile, IBM is developing new products it promises will surpass the functionality and flexibility of DEC's best distributed applications. Right now, DEC is sitting pretty, according to our survey. When asked to give their general opinions of a list of vendors, respondents gave DEC the second highest rating overall (see Figure 5, Vendor Reputation Index). A companion ranking—the Vendor Popularity Index (Figure 4)—shows that a number of respondents' opinions of DEC had improved recently—by a factor greater than for any other vendor.

IBM scored lower on both the Vendor Popularity and Vendor Reputation Indexes. But respondents' opinions of, and plans to implement, a variety of products that are key to IBM's anti-DEC strategy—the 937X midrange processor, the Token-Ring Network, Advanced Peer-to-Peer Networking, DB2, and advanced micros—bode well for IBM in the future.

This first of a quarterly series that will be conducted in collaboration with Paine Webber Inc., one of Wall Street's major investment firms, probed the plans and priorities of MIS managers in large corporations to identify key product implementation

Figure 1

CAPACITY INDEX

Percentage of respondents reporting mainframe and mini capacity utilization of 75 percent or greater.

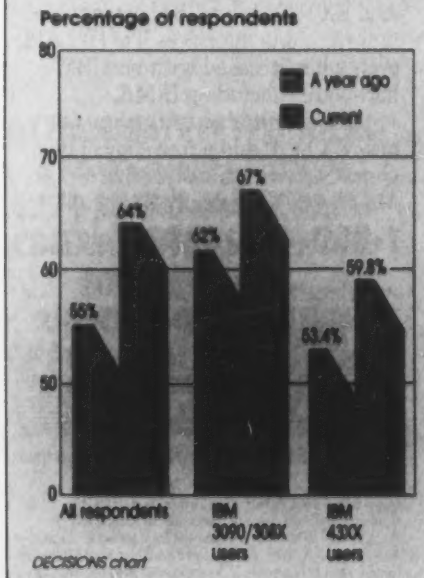


Figure 2

DIGITAL-ANALOG INDEX

Responses to question: "Roughly what percentage of your organization's voice communications were/will be digital in nature?"

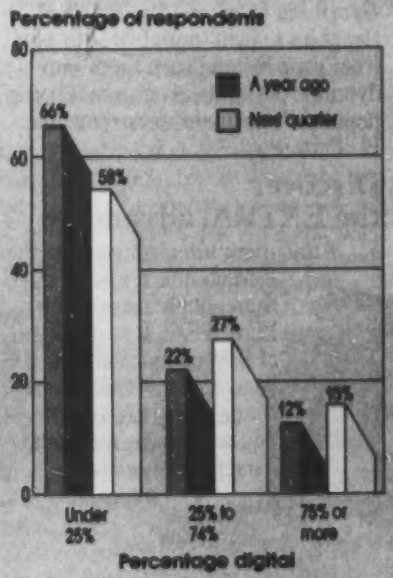
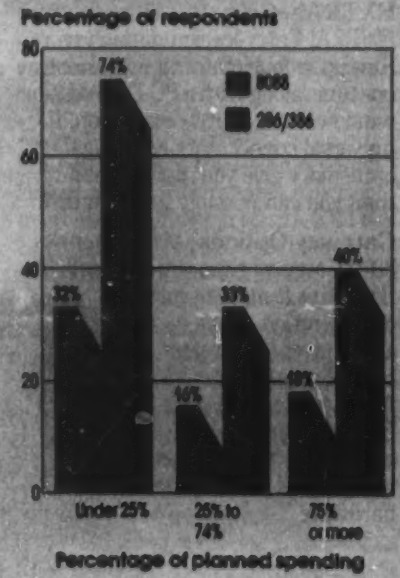


Figure 3

PC SPENDING INDEX

Responses to: "Characterize your planned IBM-compatible micro purchases during the next quarter by type of microprocessor." (286 and 386 processors are combined in chart.)



MIS ATTITUDES

trends. We also asked respondents to report on present capacity utilization. The indexes that accompany this article are the first of many that will be updated quarterly. There are also responses to specific questions about specific systems—like IBM's 937X.

The data we've compiled here reflect the current attitudes of the computer industry's most important customers. Overall response to our survey was outstanding, totaling 24 percent of a sample of 5,126 and representative of thousands of MIS decision makers. Recipients of the questionnaire were chosen at random from key groups among our subscribers: MIS executives, managers, and supervisors in the nation's largest corporations. A supplemental list of 126 "chief information officers" rounded out the sample. Many of the respondents are IBM users: 33 percent operate 3090s, 42 percent have 308Xs, and 37 percent have 43XXs. Almost 25 percent, however, use non-IBM mainframe equipment.

Generally, the survey results point to higher spending by MIS both during the current quarter and the remainder of the year. "I wouldn't say we're in for a boom, but spending plans are more positive than expected," says Stephen K. Smith, vice president for research at Paine Webber. Survey results also suggest what's behind the increase.

IBM's midrange hope

Four separate questions on the survey asked respondents for their opinions of IBM's 937X and their plans for buying and using it. The first conclusion their responses point to is that orders for the 937X are softer than IBM claims. Of the respondents from the general sample who answered the question, "If you plan to buy 9370s, for what purpose will you use them?," 54 percent said they have no plans to buy the 937X. Of respondents with IBM 3090 or 308X mainframes, 49 percent reported no plans to buy the 937X. Fifty-three percent of those with 43XX mainframes don't plan to install the new machine.

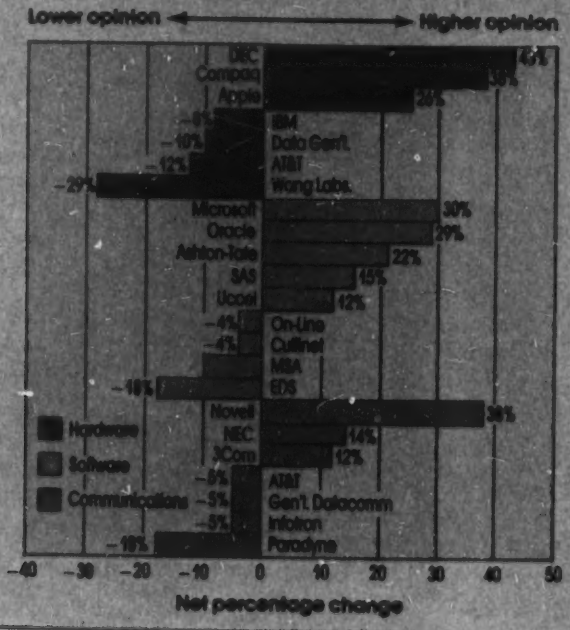
Smith, who follows IBM and other major hardware vendors for Paine Webber, isn't surprised by these results. "The 937X is still being evaluated by MIS," he says, and many of the orders IBM says it has received aren't firm—rather, they reflect the common MIS practice of submitting orders to, in effect, reserve machines. Thus, the 937X's relative success is still an open question; if the evaluations underway go well, Smith believes orders for IBM's new processor will take off.

DEC's VAX is in virtually the same position in respondents' plans as is the 937X. Among the general group of respondents, 49 percent reported having no plans to buy VAXs. However, the figure dropped by only 2 percent for IBM mainframe sites. Together, Smith views these results as a "tre-

Figure 4

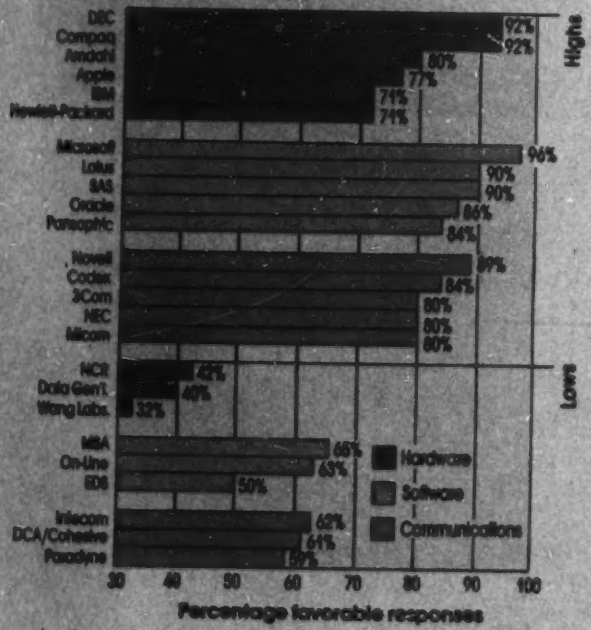
VENDOR POPULARITY INDEX

Ranking based on responses to: "During the last quarter, how has your opinion of the following vendors changed as a potential supplier?" (Chart is a sampling of a 48-vendor survey; highs and lows are represented.)



VENDOR REPUTATION INDEX

Calculated by adding percentage of respondents reporting favorable but unchanged opinion to percentage reporting opinion that changed for the better.



mendous testimony" to DEC and the VAX. "The results say that DEC's success is pretty broadbased," he says. On another question, which asked users about their spending plans with six vendors, the percentage of respondents with large IBM mainframes who said they'd increase spending on DEC products by 25 percent or more (43 percent) was higher than the percentage of respondents overall (37 percent) who would do so, Smith notes.

Smith believes the larger significance of this finding is that DEC's inroad into corporations with large IBM mainframes—the elite of Big Blue's accounts—is proceeding apace. The findings indicate DEC is strong among IBM mainframers, he says.

The respondents also shot holes in IBM's contention that the 937X, which extends the 370 mainframe architecture to the office, will stimulate demand for larger mainframes. IBM's prospects are crucial to Wall Street: Anything that chips at Big Blue's highly profitable mainframe business isn't viewed kindly. Among the general group of respondents to a question on the subject, 19 percent said the 937X would reduce their need for larger mainframes. Only 9 percent indicated the opposite, a difference of 10 points. The remainder expected no change. Roughly the same percentages (20 percent said reduce; 10 percent said raise) held true in 3090/308X sites, but a greater percentage of 43XX user/respondents (24 percent) expected the 937X to reduce their need for larger mainframes. Nine percent thought it would raise their need for bigger computers.

Yet responses to this question must be recognized for what they are: indications of what respondents *expect* to happen. History tells us that IBM's theory about the 937X's effect on mainframe demand is reasonable: The same basic debate erupted when the IBM Personal Computer appeared six years ago, and there's no question now that the PC raised demands for mainframe capacity. Time will tell if the 937X produces the same effect. For the short term, the good news for IBM is that only 15 percent of the respondents from IBM sites said they'd install 937Xs rather than larger—and more profitable for IBM—370-type mainframes.

Smith says the 937X will have a negative effect on demand for larger IBM mainframes, but he believes it won't be manifested for some time. Why? Survey results suggest to him that respondents with IBM systems haven't made rapid progress toward distributed systems. Until they do, the 937X's effect on demand for other systems will be negligible, says Smith.

Other questions on the survey indicate that IBM can expect to get a healthy slice of a bigger MIS spending pie. Forty-nine percent of respondents said their IBM spending would increase. That's almost three times as many respondents who said their IBM spending would fall this year. Thirty-seven percent said their IBM spending this year would exceed last year's by more than 25 percent. Smith believes this is clear evidence that, for IBM, the worst of a two-year spending slump is over.

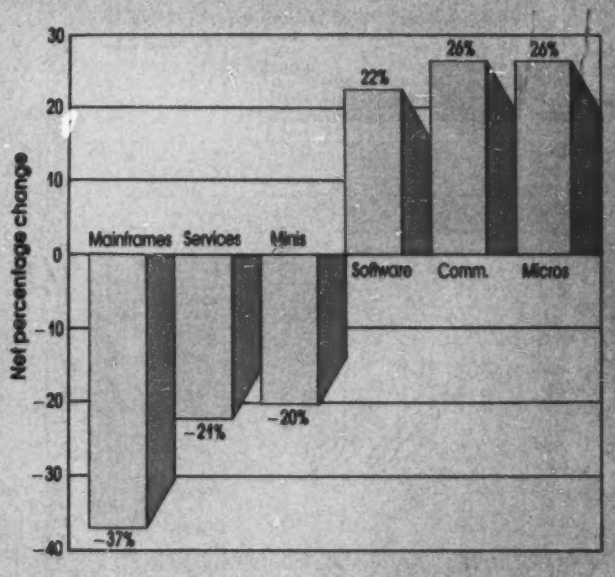
Results from other questions help to explain what's behind this increase. The answers to the question, "Do you anticipate overall your spending for the coming quarter will decrease, increase, or not change from the same period in 1986?," point to higher spending across the board by the base of respondents, a trend that probably will benefit IBM. Micros and communications, and to a lesser extent, software, will be the focus of this

(Continued on page 81)

Figure 6

SPENDING INDEX

Ranking based on responses to question: "For the following categories, do you expect your overall spending for the coming quarter to decrease, increase, or not change from the same period in 1986?"

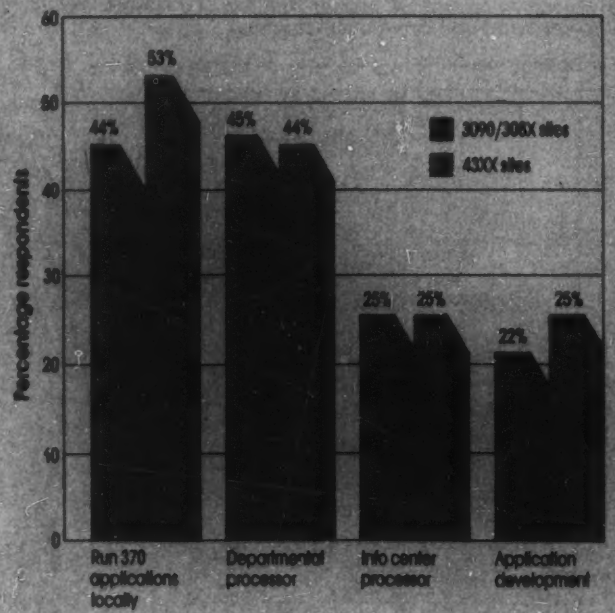


DECISIONS chart

Figure 7

IBM USERS' 937X PLANS

Response by IBM users to question: "If you plan to buy 937Xs, for what purpose will you use them?"



Charts by Denise Bonbeni

(Continued from page 76)
increased spending (see Figure 6), and IBM is well positioned in each category, with its advanced PCs (including the new Personal System/2), its Token-Ring Network, and its relational databases. Responses to other questions about which micros, LANs, and DBMSs respondents plan to buy indicate healthy demand for all these IBM products.

In our analysis of the spending priorities of the respondents, mainframes—IBM's cash cows—show the least growth. Respondents were asked whether they plan to buy a mainframe and, if so, which one. Sixty-five percent said no, and although 16 percent said they planned to buy a 3090, demand for 43XX mainframes was about a third of that. Do these results suggest that weak mainframe demand threatens IBM's otherwise bucolic picture? Smith doesn't think so. These numbers shouldn't be taken at face value, he says. "The mainframe spending numbers were much better than I expected," he says.

Smith cites other positive signs for IBM. The percentage of respondents reporting an increase in mainframe and mini capacity utilization of 75 percent or more between last and this year rose (See Figure 1). Capacity utilization is a widely watched indicator of future hardware spending, and vendors typically peg users who cross the threshold of 75 percent utilization to be ready for new larger systems.

Responses also suggest mini spending will be more robust than mainframe spending, a finding that surprised Smith. The trend was most marked among 3090/308X users, Smith notes. "Demand among those users is being driven by the move toward using PCs and networks to distribute processing," he says.

Of course, healthy demand for minis may help to explain DEC's spectacular showing on the question about spending with specific vendors. Those anticipating an increase in DEC equipment purchases outnumbered those planning a decline by almost six to one. The vendor with the gloomiest result on this question was Wang Laboratories Inc. (Lowell, MA). Respondents who said their spending on Wang will decline this year outnumbered those expecting an increase, the only such case among the six vendors included in this question. Flat spending was indicated for the others, Hewlett-Packard Co. (Palo Alto, CA), Data General Corp. (Westboro, MA), and Prime Computer Inc. (Natick, MA).

Responses to the question about spending priorities generally support the notion that corporations are spending more and more on micros and communications. The results of questions about micros suggest two trends. First, significant percentages—as much as 74 percent, in one category—of respondents reported plans to purchase "advanced" IBM-compatible micros—those designed around the Intel 80286 and 80386 microprocessors—which suggests that these machines are the focus of micro spending by MIS. (See Figure 3.)

Second, responses to a different micro spending question suggest that the additional planned "micro spending" will include printers, modems, and software. In that question, respondents were asked which vendors they'd buy micros from next quarter, and which they bought from last year. Each manufacturer registers a drop between the number of respondents who made purchases last year and the number who plan to this year. For example, 83 percent of the respondents to that question said they bought micros from IBM last year, while 69 percent plan to buy from IBM this year.

Does this result point to a reduction in micro spending, contradicting other questions on the survey? Probably not. Planned spending on micros very likely includes more than just the computers themselves. Also, given that respondents indicate plans to buy more high-priced 286- and 386-based micros, they could conceivably spend more in buying from fewer vendors. Finally, the results of this question could simply suggest that lots of respondents hadn't decided who they'd buy from.

Communications directions

Spending on communications is also increasing. For example, respondents indicate that plans to install local-area networks are heating up. Not surprisingly, the focus of our respondents is on IBM's Token-Ring Network and DEC's DECnet and other Ethernet-type LANs. Twenty-four percent of the respondents to this question said they planned to install Token-Ring LANs this quarter; one-third of the respondents with IBM 3090/308Xs said they'll install them.

This is good news for IBM, because it indicates the Token-Ring Network may finally have turned the corner. Criticized by users and consultants as buggy and balky, the Token-Ring got off to a slow start.

DECnet/Ethernet was the next most popular LAN option, at 16 percent, both overall and in IBM mainframe sites. AT&T's Starlan is not as popular an option, with only 3 percent planning to install next quarter, but when compared with last year's 2 percent, the results could be interpreted to mean that its popularity is growing.

Network development

Aside from LANs, where will respondents be directing their attention—and dollars—within the broad category of communications? Another question, which asked respondents which products and standards are most important to their network development plans, suggests answers. Among all respondents to this question, X.25, the international packet-switching protocol, is the top priority, followed closely by IBM's Advanced Peer-to-Peer Networking scheme,

SURVEY METHODOLOGY

The DECISIONS/Paine Webber Survey of MIS Attitudes was conducted by mailing questionnaires to 5,000 *Computer & Communications* DECISIONS subscribers randomly selected from a larger group of subscribers holding managerial titles within MIS organizations in large corporations. Questionnaires were also sent to a supplemental list of 126 chief MIS executives at the nation's largest corporations.

The questionnaires were mailed during the third week of February with a March 25th deadline. By the deadline, 1,240 responses—24 percent of the sample—had been received.

The responses were tabulated and analyzed by SPSS Inc. (Chicago), using SPSS-X, a statistical analysis and data management package for large systems.

IBM's Netview network management system, and DECnet. These results are shuffled when looking at IBM mainframe sites. Not surprisingly, Netview and APPN are the top priorities for those respondents.

The fifth and sixth priorities were electronic data interchange (EDI), a networking technology aimed at reducing paperwork, and ISDN, the Integrated Services Digital Network standard proposed to make the public phone network a flexible data highway system. AT&T, ISDN's chief proponent, has only recently announced products implementing the standard, and analysts don't expect ISDN to become a widely available option for users until the next decade arrives.

Responses to another question suggest that the long-heralded era of integrated—digital—voice and data communications is still only nascent. One question asked what percentage of the communications at respondents' organizations were digital in nature last year and will be digital in the next quarter. The largest group of respondents said under 25 percent, but their numbers are gradually declining. Of those respondents, 66 percent said under 25 percent of their organizations' communications were digital last year. Fifty-eight percent of the respondents to this question said they expected digital communications to be less than 25 percent or less of their organization's total next quarter. (See Figure 2.)

The responses on digital communications surprised Jack Grubman, Paine Webber's communications analyst. "If digital communication isn't as pervasive as people think it is, and if it is growing, then there might actually be life left in the PBX business," he says. Grubman is reevaluating the growth prospects of the PBX vendors, particularly AT&T and Northern Telecom (Nashville, TN).

DBMS: An IBM onslaught

IBM is successfully raising its revenues from software (see Performance Report, page 119), and the results of questions about DBMSs help to explain why. In the race for the lead in new installations in what might be described as the relational era, IBM's relational DBMSs, DB2 and SQL/DS, have jumped out to take big leads. According to our results, Oracle from Oracle Corp., Belmont, CA, is the only IBM competitor mounting a serious challenge to IBM. IBM's gains, according to these results, will be principally at the expense of its own IMS DBMS and IDMS/R from Cullinet Software Inc., Westwood, MA. Cullinet has a healthy installed base among respondents (14 percent), but few (1 percent) plan new installations of IDMS/R as their primary production DBMS. However, all other IBM competitors on our list, with the exception of Oracle and Relational Technology Inc. (Alameda, CA), makers of Ingres appear to share Cullinet's woes.

DB2's lead in the DBMS race is substantial. Overall, 13 percent of the total sample reported plans to install DB2 as a primary DBMS, double the number that have already installed it for this purpose. No other product showed such strength in the results. Only SQL/DS showed an increase—from 3 percent to 3.5 percent; for all other products, the percentage of respondents who indicated plans to install was lower than the percentage of those currently using the product.

DEC's VAX is in virtually the same position in respondents' plans as is the 937X.

Responses to our survey indicate, however, that distributed databases are clearly the leading edge of DBMS technology. Only 18 percent of the respondents said they were "moving ahead" with distributed DBMSs this year. Seventy percent of the respondents to a question asking about attitudes toward distributed relational DBMSs indicated they were waiting and watching. Of those, 40 percent characterized the technology as being "too immature to seriously consider," and 16 percent said they were waiting for an IBM offering.

Popularity contest

Our Vendor Popularity and Vendor Reputation Indexes give the highs and lows among hardware, software, and communications equipment vendors in two parts. The Vendor Popularity Index provides an indication of how a vendor has fared among repondents who've recently changed their opinions about it. The index is the difference between the percentage of respondents who said they've recently changed their opinions for the better and those who said their opinions changed for the worse. The Vendor Reputation Index is a long-term measure. It is the sum of the percentages of respondents who indicated a favorable opinion, either changed or unchanged. Each index is revealing, but neither in itself shows the entire picture of a vendor's standing in the minds of respondents.

There were few surprises among the top and bottom finishers in this popularity poll. DEC has been riding high, and Compaq's reputation apparently was enhanced by last fall's announcement of a micro based on the 386 chip. Apple did much to change opinions among MIS managers in the early part of this year: It finally announced an "open" Macintosh and communications facilities corporate MIS had been demanding.

Microsoft Corp., Redmond, WA, was first among the micro vendors in popularity. Microsoft, Lotus Development Corp. (Cambridge, MA), and Ashton-Tate (Torrance, CA) each scored far better among respondents than did mainframe software vendors. Bob Therrien, Paine Webber's software and services analyst, believes micro software enjoys a reputation for helping meet user applications needs. "Mainframe software vendors show up less positively, because dp has had longer experience with them and more time to get crusty about them," he says.

The lowest marks in the software and communications groups were suffered by Electronic Data Systems, the Dallas-based General Motors subsidiary late under Ross Perot's leadership, and by Paradyne Corp. (Largo, FL), the data comm hardware supplier. Each of these results was not unexpected, and may be due as much to recent (particularly in EDS' case) bad publicity about company management as much as it is the result of respondents' experiences. Is it fair to consider such publicity? Certainly. Anything that affects the opinions of MIS managers is part of the challenge for vendors in a crowded marketplace. ■

The next in this series of Computer & Communications DECISIONS*/Paine Webber Surveys on MIS Attitudes will appear in our September issue.*

Leaders (left to right): Tse of Wyse Technologies, Foster of Stratus Computer, and McNealy of Sun Microsystems.

PERFORMANCE REPORT

Systems & peripherals: Winners and losers of 1986

IBM slowed and DEC crowed. Smaller vendors found exploring new markets the strategy for success, the first of DECISIONS Performance Reports reveals.

by Lee Keough

Last year at The Stanley Works, information systems spending slowed. National economic conditions, combined with product and investment cycles, had slaked the giant New Britain, CT-based hardware and tools manufacturer's thirst for more computers.

This year is different. Data processing spending will increase, although not dramatically, says James B. Gustafson, Stanley's director of information systems. The upswing reflects the top brass' recognition that investments in information systems are necessary to achieve a strategic advantage over their competition, he says. Moreover, Gustafson's spending patterns are changing. Instead of buying all Big Blue boxes, Gustafson plans moderate increases in his budget for IBM systems with significant dollars now earmarked for Digital Equipment Corp.'s VAX minicomputers.

Gustafson is not alone. That's clear from DECISIONS' Large Systems survey, which tracks the yearly performance of the dominant processor and peripheral vendors. IBM's financial results for 1986 were dismal, although many expect better times ahead (see "IBM's slump: Your opportunity," page 124). The prime beneficiary among vendors of IBM's troubles—and the resounding market winner—was, of course, DEC.

The success of DEC and other vendors had analysts hailing the end of hard times for the computer industry. "The so-called slump is not a slump anymore," says Will Zachmann, vice president at International Data Corp., Framingham, MA. "Those who are riding the wave of new technology are doing fantastically," he adds, referring to vendors of smaller systems and systems based on microprocessors. Sun Microsystems Inc. and Stratus Computer Inc. exemplify this trend. Each enjoyed robust sales growth in 1986. Also doing well are Tandem Computers Inc., which is benefiting from the trend toward distributing processing, and Cray Research Inc., proving that the demand for supercomputers is still hot as users find new applications for these fast, powerful, and expensive systems.

The DECISIONS survey ranks vendors by 1986 total data processing revenues—not just sales from large systems—and compares them to 1985 performance. Vendors are arranged by their main lines of business. Processor vendors are grouped separately from those whose primary business is to market peripherals or sell computers to the scientific and engineering markets.

From the survey, it is clear that traditional large systems vendors grew slowly last year, gaining only 5 percent over 1985, an equally slow year. But IBM, one of the worst performers, skewed the results. When IBM is removed from the picture, the remaining large systems vendors averaged a 9 percent gain.

Zachmann, who was one of the first industry watchers to predict a deep and enduring computer slump, credits the move to smaller systems and a flat economy for forming the underly-

'86	'85	Company	'86 Dp Revenues (000)	'85 Dp Revenues (000)	% Growth
		Processors			
1	1	IBM *(Armonk, NY)*	49,300,000	48,100,000	2
2	2	Unisys Corp.* *(Blue Bell, PA)*	9,536,700	9,058,100	5
3	3	Digital Equipment Corp. *(Maynard, MA)*	8,414,309	7,029,407	20
4	4	NCR Corp. *(Dayton, OH)*	4,377,588	3,883,563	13
5	5	Hewlett-Packard Co. *(Palo Alto, CA)*	3,950,000	3,700,000	7
6	6	Control Data Corp. *(Minneapolis, MN)*	3,346,700	3,679,700	−9
7	7	Wang Laboratories Inc. *(Lowell, MA)*	2,668,900	2,428,300	10
8	8	Honeywell Inc. *(Minneapolis, MN)*	1,900,000	1,700,000	12
9	9	Data General Corp. *(Westboro, MA)*	1,287,600	1,190,280	8
10	10	Amdahl Corp. *(Sunnyvale, CA)*	966,349	862,032	12
11	11	Prime Computer Inc. *(Natick, MA)*	860,173	769,673	12
▲12	14	Tandem Computers Inc. *(Cupertino, CA)*	835,767	634,546	32
▼13	12	Texas Instruments Inc. *(Dallas)*	750,000	760,000	−1
▼14	13	National Semiconductor Corp. *(Santa Clara, CA)*	700,000	650,000	8
▲15	17	Cray Research Inc. *(Minneapolis, MN)*	596,685	380,158	57
▼16	15	Harris Corp. *(Minneapolis, MN)*	464,000	500,000	−7
▼17	16	Datapoint Corp. *(San Antonio, TX)*	322,776	414,682	-22
▲18	20	Gould Inc. *(Rolling Meadows, IL)*	300,000	248,000	21
▼19	18	MAI Basic Four Inc. *(Tustin, CA)*	287,857	249,405	15
▲20	23	Recognition Equipment Inc. *(Dallas)*	241,795	163,147	48
▼21	19	Concurrent Computer Corp. *(Holmdel, NJ)*	235,849	267,785	-12
22	22	NBI Inc. *(Boulder, CO)*	165,000	172,000	−4
▲23	25	Altos Computer Systems *(San Jose, CA)*	139,481	132,182	6
▲24	28	Computer Consoles Inc. *(Rochester, NY)*	129,600	111,880	16
▲25	30	Stratus Computer Inc. *(Marlboro, MA)*	124,559	80,164	55
		Total Processors	91,901,688	87,165,004	5
		Processors without IBM	42,601,688	39,065,004	9
		Peripherals			
1	1	Xerox Corp. *(Stamford, CT)*	1,890,000	1,609,000	17
2	2	Memorex Corp. *(Santa Clara, CA)*	906,000	835,000	9
▲ 3	5	Telex Corp. *(Tulsa, OK)*	741,621	597,426	24
▼ 4	3	Storage Technology Corp. *(Louisville, CO)*	696,000	673,400	3
▼ 5	4	ITT Corp. *(New York, NY)*	631,250	625,000	1
6	6	Bell & Howell Int'l. LV *(Skokie, IL)*	263,200	236,800	11
7	7	General Dynamics Corp. (Datagraphix Inc.)** *(San Diego, CA)*	240,700	225,000	7
▲ 8	10	Wyse Technology *(San Jose, CA)*	228,360	120,478	90
▼ 9	8	Decision Industries Corp. *(Horsham, PA)*	195,083	176,378	11
▼10	9	National Computer Systems Inc. *(Minneapolis, MN)*	190,254	139,685	36
▼11	13	Lee Data Corp. *(Eden Prairie, MN)*	109,443	88,366	24
12	12	System Industries Inc. *(Milpitas, CA)*	109,308	95,705	14
▼13	11	Televideo Systems Inc. *(Sunnyvale, CA)*	91,462	103,088	-11
		Total Peripherals	6,292,681	5,525,326	14
		Scientific and Engineering			
1	1	Intergraph Corp. *(Huntsville, AL)*	605,737	526,405	15
2	2	Computervision Corp. *(Bedford, MA)*	494,672	441,944	12
▲ 3	7	Lockheed Corp.* *(Calabasas, CA)*	440,000	160,000	175
4	4	Apollo Computer Inc. *(Chelmsford, MA)*	391,685	295,575	33
▼ 5	3	Tektronix Inc. *(Beaverton, OR)*	387,825	412,875	−6
▲ 6	8	Sun Microsystems Inc. *(Mountain View, CA)*	341,088	147,100	132
▼ 7	5	Schlumberger Ltd. *(New York, NY)*	245,000	214,000	14
▼ 8	6	Gerber Scientific Inc. *(South Windsor, CT)*	209,075	210,387	−1
9	9	Daisy Systems Corp. *(Mountain View, CA)*	95,956	133,637	-28
10	10	Valid Logic Systems Inc. *(San Jose, CA)*	60,907	56,057	9
		Total Scientific and Engineering	3,271,945	2,597,980	26
		Total Processors and Peripherals	98,194,369	92,690,330	6
		Total Large Systems	101,466,314	95,288,310	6

Total '86 Revenues (000)	Total '86 Profits (000)
51,250,000	4,789,000
9,536,700	(43,400)
8,414,309	861,588
4,881,641	336,524
7,102,000	516,000
3,346,700	(264,500)
2,668,900	(86,400)
5,378,200	(398,100)
1,287,600	(26,800)
966,349	41,829
860,173	46,925
835,767	79,215
4,974,000	29,100
1,678,000	(53,600)
596,685	124,815
2,106,428	69,592
322,776	(4,992)
908,000	34,600
287,857	10,406
241,795	10,539
235,849	4,804
283,087	(5,173)
139,481	19,075
129,600	(2,977)
124,559	13,519
12,919,000	465,000
906,000	N/A
816,977	69,734
696,000	36,000
7,595,540	493,720
853,409	32,895
9,211,400	(52,500)
228,360	16,664
195,083	7,750
190,254	16,332
109,443	2,588
109,308	4,636
91,462	(2,272)
605,737	70,362
494,672	(5,774)
10,273,000	408,000
391,685	9,331
1,352,409	55,131
341,088	30,607
4,938,420	(2,017,591)
209,075	19,131
95,956	(1,081)
60,907	(7,067)

*Adjusted to reflect acquisition for CY '86
**Datagraphix sold to Anacomp Inc. in CY '87

ing dynamic in the industry. "The economy causes more budget pressure, and when people are buying large systems, there is more rigorous scrutiny. That provides a powerful incentive for users to meet their needs with smaller systems. The right strategy is to put as much as you can on the desktop and move it off only if there is no other choice," he says.

Gustafson is following that strategy to the letter. Gustafson is moving applications off the mainframe, and says DECnet and a single architecture make the VAX an obvious choice as the cornerstone for new systems. He might have selected one of IBM's 937X machines, but "I can't wait for it," he says.

Confirming that view is David S. Currence, systems planning manager for Westinghouse Electric Corp., Pittsburgh. Currence notes that a micro yields more MIPS (millions of instructions per second) per dollar than a mainframe, so it makes sense to move toward distributed processing. "We're still buying mainframes, but more and more we are turning them into network engines [serving smaller processors]," Currence says. Because the economy has expanded a bit, there has been a slight relaxation on budget constraints, Currence adds. But those dollars won't be spent according to spending patterns of the past.

Also working against traditional systems vendors is the newfound independence of MIS managers, who are more likely to seek out bargains from plug-compatible and other vendors, and the aging product lines of many of the larger vendors, such as IBM, Unisys Corp., and Hewlett-Packard Co. "In the last couple of years there has been little to spark interest, no major breakthroughs in technology," says one MIS director who asked not to be named.

"Everyone looks for magic when a company does well," says Rick Martin, an analyst with Sanford C. Bernstein, a Wall Street brokerage. "DEC, for example, is near the beginning of its product cycle with many of its VAXs. You can do a fantastic business replacing your installed base, but it's not magic."

DEC is particularly fortunate to have a strong product line at a point when IBM is weak. The only relatively new IBM product shipped last year was the 3090 mainframe. Says Zachmann, "Without that, IBM would have been in really bad shape." Even though the 3090 sold well, Zachmann says it doesn't disprove his theory of downsizing for success. "IBM didn't sell many more 3090s than it did 3080s," when 3080s were originally shipped, he says.

Other vendors, such as Data General Corp. and Wang Laboratories Inc., lost out to DEC's message of a single architecture and networking ease. DEC, many observers note, has become as safe a supplier as IBM, and that's not only to IBM's detriment.

Datapoint Corp., which sells a proprietary system and has been embroiled in corporate controversy, reported the worst results in this category. Those results don't reflect the efforts of Doris Bencsik, Datapoint's new chief executive officer, to turn Datapoint around. Since replacing Edward P. Gistaro early this year, she's ordered a complete restructuring, including layoffs and writeoffs.

The peripherals market, led by Xerox Corp., Wyse Technology, and Telex Corp., turned in a better average performance than its systems counterparts, growing by about 14 percent over the previous year. But the comparative swings between vendors varied widely, reflecting the several subdivisions of the peripherals market, including printers, terminals, and storage devices. Peripherals sales are largely tied to those of systems, and the lackluster performance of many systems vendors weighed down the demand for peripherals.

Yet there were other factors. Xerox, for example, has had significant success in selling nonimpact printers, currently a hot market. Affordable laser printers are opening up new applications to users. Kathy Dingman, an analyst at CAP International, Marshfield, MA, a market researcher specializing in printers, says vendors are benefiting as a transition from impact to nonimpact printers takes place. U.S. vendors, which comprise the DECISIONS list, scored particularly big since they did not have to battle a rising yen, she says.

This doesn't explain the success of Wyse and Telex, however, two leading terminal vendors. Both are the leading nonprocessor vendors in their respective markets, with Wyse heading the ASCII and ANSI market, and Telex winning in the 3270 arena. Other vendors, such as ITT Corp. and Televideo Systems Inc., are having more

difficulty in these highly competitive, low-price, low-margin markets. A chief reason for the success of Wyse and Telex, however, was their willingness to start new businesses.

Bernard Tse, chief executive officer of Wyse, says he can keep even with the competition in terminals by offering more features and reducing costs through engineering and design. Yet Tse is gaining ground by moving into the sale of micros, monitors, and high-resolution graphics displays. Last year Wyse also acquired Amdek, a leading vendor of monitors for the IBM Personal Computer. Tse envisions that other vendors' micros based on Intel Corp.'s 80386 chip will continue to spur demand for his company's new products.

Telex has also moved beyond merely offering 3270 terminals and controllers. It, too, has expanded into micros and now sells terminals for IBM System/3X minis.

Sales of storage products also correlate to system sales, but Memorex Corp. and Storage Technology Corp., along with Amdahl Corp. and National Advanced Systems, the IBM plug-compatible subsidiary of National Semiconductor Corp., grew directly at IBM's expense. "As a whole, the storage market is growing at the same rate as systems sales," says Dave Vellante, storage analyst at IDC. "But the PCMs are gaining on IBM." This is because PCMs now offer cheaper, but equally reliable disk drives, and more varied product lines.

Courtesy of Datapoint

Better times ahead? New CEO Doris Bencsik has moved quickly to get Datapoint Corp. back on track.

The one group of vendors that enjoyed high growth rates in 1986 were those selling to computer-aided design/manufacturing and other scientific and engineering markets. Lockheed Corp. showed a large increase primarily because of its acquisition of Sanders Associates, Nashua, NH, which almost doubled its size. But Sun Microsystems achieved an astounding 132 percent growth rate without any acquisitions.

The demand of engineers for distributed processing and single-user workstations is what enabled Sun—and, to a lesser extent, Apollo Computer Inc.—to grow at such a high rate. Until low-cost engineering workstations became available, teams of engineers shared workstations, enduring lengthy response times while the computer worked on a colleague's problem. Apollo has lagged because its product cycle is a step behind Sun's, says David Burdick, director of CAD/CAM research for San Jose-based Dataquest. Apollo recently introduced new workstations, and Burdick expects both Apollo and Sun to continue growing at a fast pace.

The success of Apollo and Sun didn't damage CAD/CAM vendors such as Computervision and Intergraph last year, says Burdick. They are emphasizing software and peripherals rather than computer systems. Rather, minicomputer vendors with a strong presence in engineering and the factory, such as Data General Corp. and Prime Computer Inc., are losing ground to Sun and Apollo.

It seems as though some vendors, like Data General, are losing ground at every turn. Whether they have the stamina and acumen to adjust to new market conditions will determine whether they will survive the 1990s. "The fundamentals are only going to get worse," warns Zachmann.

Not everyone agrees, of course. "There is a degree of saturation at the current level of computing," says Kimball Brown, a Dataquest analyst. "Before 1980, you had to be a programmer to use a computer. The PC brought the end user in, but there hasn't been much progress since then. Once everything can be networked, the end-user pie will grow, and unit shipments of large systems will skyrocket." A lot of vendors hope Brown, not Zachmann, has the right crystal ball. D

ON THE FAST TRACK . . .

Company	'86 Revenues (000)	% Growth	'85 Revenues (000)
1 Lockheed Corp.*	440,000	175	160,000
2 Sun Microsystems Inc.	341,088	132	147,100
3 Wyse Technology	228,360	90	120,478
4 Cray Research Inc.	596,685	57	380,158
5 Stratus Computer Inc.	124,559	55	80,164
6 Recognition Equipment Inc.	241,795	48	163,147
7 National Computer Systems Inc.	190,254	36	139,685
8 Apollo Computer Inc.	391,685	33	295,575
9 Tandem Computers Inc.	835,767	32	634,546
10 Telex Corp.	741,621	24	597,426

*Adjusted to reflect acquisition for CY '86

. . . IN THE SLOW LANE

Company	'86 Revenues (000)	% Growth	'85 Revenues (000)
1 Daisy Systems Corp.	95,956	-28	133,637
2 Datapoint Corp.	322,776	-22	414,682
3 Concurrent Computer Corp.	235,849	-12	267,785
4 Televideo Systems Inc.	91,462	-11	103,088
5 Control Data Corp.	3,346,700	-9	3,679,700
6 Harris Corp.	464,000	-7	500,000
7 Tektronix Inc.	387,825	-6	412,875
8 NBI Inc.	165,000	-4	172,000
9 Texas Instruments Inc.	750,000	-1	760,000
10 Gerber Scientific Inc.	209,075	-1	210,387

DECISIONS chart

PERFORMANCE REPORT

IBM's slump: Your opportunity

As Big Blue ponders ways to woo new customers and keep the faithful from straying, it must listen to MIS.

by Lee Keough

MIS managers will enjoy an advantage in dealing with IBM this year if, as Shakespeare wrote, "What's past is prologue ..." IBM's response to last year's huge drop in demand for its products in this country and poor sales worldwide was to reduce prices, ramp up new product introductions, and outline new strategies to answer customers' complaints. Because IBM's precipitous decline in profits has not been reversed, users can expect to get sweeter deals and better products from Big Blue this year. Indeed, IBM has dubbed 1987 the "Year of the Customer," vowing to be more responsive to users' needs.

Within the last nine months, IBM has embarked on a new architectural initiative, Systems Application Architecture; announced a long-awaited new family of microcomputers; introduced the first office computers that can run software for its mainframes; improved the performance of its systems; and reduced the price of its most important product, the 3090 mainframe.

Although these announcements promise to reshape information processing for the rest of this century, they will not do much for IBM this year, analysts say. So to keep users from defecting to the competition when they need to build new applications, IBM is likely to continue improving its prices and products. Expected new offerings include a mid-range processor family that will run applications written for either the System/36 or S/38 and a triple-density, 7.5-gigabyte disk drive.

"Right now, IBM is on the defensive," says Charles T. Casale, director of research for the Yankee Group, Inc., Boston. "That will change within one to one and a half years, and that's when we'll see a spectacular battle for new applications [between IBM and other vendors, particularly Digital Equipment Corp.]."

Until then, Casale and others predict IBM will make incremental gains in the market—and its bottom line. "Circumstances are getting better for IBM because it is making steady, slow, unglamorous progress in the connectivity arena," Casale asserts.

Casale is referring to IBM's additions to its communications architecture, SNA, not to its newly announced software architecture, SAA. SAA will not take shape in marketable form for years—some analysts predict SAA will be available in two years, others say it won't be a reality until the next century. Yet SAA is expected to give IBM's marketing forces some relief long before it becomes a complete architecture. (See "SAA: master plan or grand illusion?," page 85).

"What IBM is hoping for, and what might occur, is that SAA will loosen the purse strings of its customers now," says Michael Braude, software analyst at the Gartner Group Inc., Stamford, CT. Braude does not think SAA will become a reality for several generations of hardware. He likens it to its sibling, SNA, which was announced 13 years ago and has just begun to take complete form.

What SAA does for IBM now is provide a response to the competitive threat posed by DEC, which is enjoying great success selling its unified software architecture. Will Zachmann, vice president of International Data Corp., Framingham, MA, calls SAA the plaster with which IBM is smoothing over the cracks between its hardware lines. DEC doesn't need such plaster—its structure is sound. "SAA only puts them even with DEC," says Zachmann. "But IBM was dead meat without it."

Even if SAA is only a future solu-

Andrew Popper/Picture Group

IBM chairman John Akers's challenge: Introduce fundamental change while stemming profit shrinkage.

tion, it should forestall user defections to competitive proprietary systems. "It should help IBM sell hardware in the short term," says Carl Claunch, director of systems planning for National Advanced Systems Inc., the Mountain View, CA-based vendor of IBM plug-compatible systems. Over the long term, a fully developed SAA could make it easier for hardware and software manufacturers to compete with IBM. Claunch envisions a future in which all software written for IBM systems can run on, for example, NCR Corp. processors. He also expects competitors to come with alternative operating systems for IBM processors.

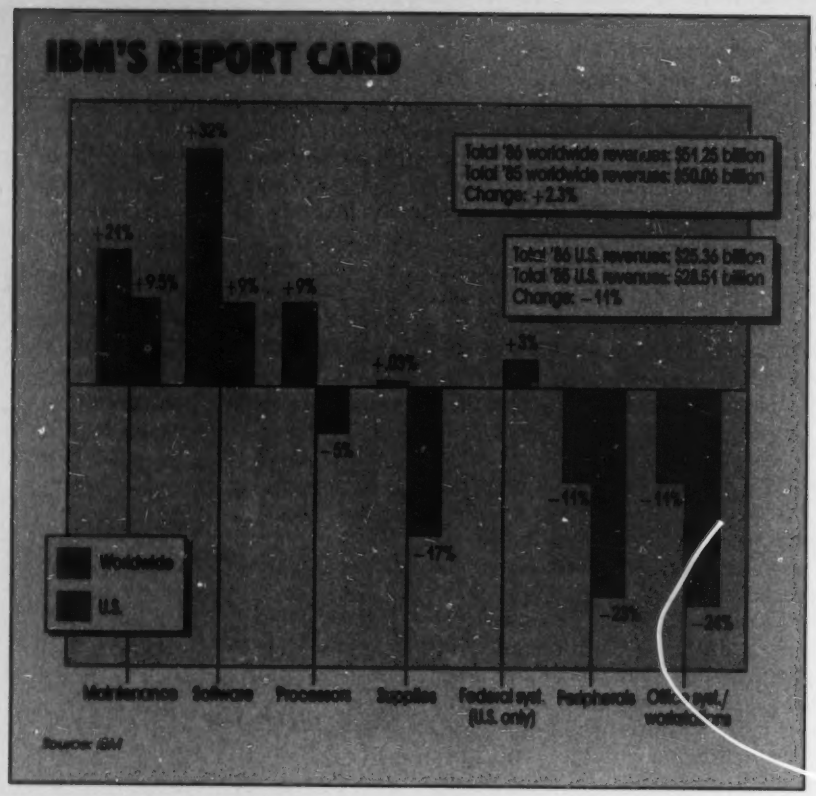
"From a competitive standpoint, SAA is a double-edged sword for IBM," says Tony Percy, director of product planning for Applied Data Research Inc., a Princeton, NJ, software vendor. Once IBM commits to a standard, such as its Structured Query Language, it allows competitors such as ADR to compete with IBM head to head. Standards negate IBM's biggest weapon: fear that IBM will change the rules.

Says Braude: "SAA creates a level playing field. It will make it easier for users to mix and match software vendors. It doesn't make it easier to compete with IBM. It makes competition more straightforward."

Also in IBM's arsenal in its battle against DEC: the new 937X midrange processor line. Most analysts agree that IBM was forced to unveil the minicomputer because of its dismal performance against DEC. Observers are debating whether the 937X will be the success IBM is hoping for, and question whether moving the shipment date from September to June will have much of an effect on IBM's financial results for this year. (For a related analysis, see "The DECISIONS/ Paine Webber Survey of MIS Attitudes" on page 74.)

"IBM originally said it would ship between 2,000 and 3,000 [937Xs] this year," says Rick Martin, an analyst with Sanford C. Bernstein & Co., a Wall Street brokerage. "By advancing it, it should sell between 4,000 and 6,000. I would be shocked if it didn't."

But Brian Jeffery, research director at International Technology Group, Los Altos, CA, is among naysayers who believe the 937X will disappoint IBM. Most current orders are "soft," he says, with users merely saving a



Worldwide, IBM grew slightly more than 2 percent last year, but U.S. sales were down significantly. With the exception of software, maintenance, and government sales, IBM experienced precipitous drops in each of its markets.

place in line. He does not believe many users are planning to buy the 937X as a departmental machine and says IBM itself only expects 10 percent to 15 percent of its customers to purchase it for office use. Jeffery says most of the systems will be sold to small and medium-sized businesses, through new channels such as the Extended Enterprise Program. The Extended Enterprise Program awards large end users huge discounts if they resell IBM equipment to affiliated businesses. For example, an auto manufacturer may buy thousands of 937Xs to resell to its dealerships, a captive market.

What's wrong with this scenario, says Jeffery, is that many end users will be competing against one another and hence overestimate sales, leading to soft orders. Beyond sales to small and medium businesses, Jeffery says the 937X will be a replacement business. "It's not going to carve out its own niche," he says.

Martin, a former product manager for the IBM 43XX series, doesn't buy Jeffery's assessment. Although he agrees there isn't a huge market for departmental processors, Martin says it is wrong to conclude the 937X will be unsuccessful. Virtually all IBM's sales—in good times or bad—are to existing installations. New, wide-open markets are few, but that is as true for DEC as for IBM, Martin argues. As a result, Martin expects enormous sales because the demand for replacements for the 43XX—previously the low end of IBM's mainframe architecture—is high, and the 937X product cycle is just beginning. IBM's business cycles have always behaved like this, but were masked by IBM's steady stream of rental revenues, which no longer exists. The 937X is expected to eliminate the last vestige of IBM's rental income, because the 43XX comprises the bulk of IBM equipment remaining on lease.

The difficulty IBM has had in selling midrange processors has been so severe that the new 937X may not be enough to reverse IBM's fortunes. Most analysts predict IBM will soon unveil a successor to its System/36 and S/38 minicomputers, codenamed Silverlake.

Martin says both Silverlake and the 937X trace their heritage to a failed IBM development project called Fort

Knox. Based on reduced instruction set computing (RISC) technology, Fort Knox was intended to run Unix as well as software written for the System/370 and System/3X. It was to be most efficient when running a new operating system. If that sounds too ambitious, there should be little surprise that the project failed.

DEC and the midrange has not been IBM's only problem. IBM has watched its market share in microcomputers erode dramatically. Although IBM's revenue explosion from micros peaked in 1984, it wasn't until last year that low-cost Personal Computer clones really began to affect IBM's finances. The solution? IBM introduced a new family of micros and a new operating system that allows IBM to regain control of the market.

The new micros, the Personal System/2 series, will not have much impact on revenues until next year, when OS/2, its new operating system, and the more powerful models of the series become available. Strangely enough, analysts are crediting the announcement with boosting sales of IBM PCs and clones. "PS/2 unfroze the market," says Casale. "Users are no longer paralyzed by FUD [fear, uncertainty, and doubt]."

Although analysts do not expect IBM to garner a big revenue boost from the PS/2 this year, they believe it could help increase profits. Martin estimates IBM's margins on the micros at 70 percent. "For that reason, the PS/2 is a very, very big deal," he says. "I look for the PS/2 to add $600 million to $900 million in profit to the corporation this year."

Once the Extended Edition of OS/2 begins shipping, it will provide an additional lift to software revenues. OS/2 will cost from $400 to $800, whereas PC-DOS costs about $100.

Yet software is hardly the market in which IBM needs help. Since 1980, IBM has evolved from obtaining almost all sales and profits from hardware to now earning more than a tenth of its revenues from software. "The growth in hardware is gone forever," says Jeffery. "IBM is halving the price of hardware every three years, so to grow, it has to increase hardware volume and software and service revenues." IBM has accomplished this high growth by hiking the price of its operating system software, unbundling it from the cost of hardware, and introducing new products. (See chart.)

"I expect software revenues to increase 28 percent to 33 percent for the next four to five years, but not through price hikes," says Braude. IBM has raised the cost of operating system software about as high as it can, he argues. Instead, Braude is looking for IBM to make gains in "applications enabling vehicles," such as TSO, and vertical applications packages for banks, manufacturers, and others. Most importantly, Braude expects sales of hardware, including the 937X, to drive software gains.

Sales of IBM's 3090 mainframes have been particularly lucrative, from both a hardware and software perspective. Initially blamed for IBM's financial slump, observers pointed to its lack of differentiation from its predecessor, the 308X, as the cause of IBM's troubles. Analysts have since changed this tune. Says Bob Djurdjevic, a DECISIONS columnist and president of Annex Research, Phoenix: "The 3090 was very, very successful and one of two recent products that met IBM's expectations, the other being the PC AT."

> ***"SAA only puts them [IBM] even with DEC. But IBM was dead meat without it."***

But because IBM's two direct competitors in the mainframe market, NAS and Amdahl Corp., Sunnyvale, CA, are aggressively marketing 3090 compatibles, IBM can no longer count on being its most powerful mainframe to bolster revenues and profits. For that reason, speculation regarding Summit, the 3090's successor, is kicking into high gear.

Jeffery argues that IBM has never gone more than a year without some form of mainframe processor introduction, and that the 3090's per-processor performance deteriorates each time a processor is added. Some analysts believe that since the 3090 now consists of up to six processors, IBM is likely to introduce a 3090 with an eight-processor configuration next. But Jeffery claims the performance degradation caused by that move would be too great. He theorizes the vendor will introduce a new generation of mainframes.

"Summit is a very definite possibility for 1988," says Kimball Brown, an analyst with Dataquest Inc., San Jose, CA. "Something has to happen, whether it is just a performance kicker for each processor or a new generation. Customers are going to demand it." Brown adds that if past practice is any indication, IBM will ship Summit next summer. "It will probably do a combination of things, the first being to increase clock speeds. Shortly thereafter it will announce Summit."

And what will Summit be? A faster and bigger mainframe, that's certain. But it will also perform more like a parallel processor, says Martin, by offloading database processing to a back-end engine, much like the 3090's vector processing facility. It will also include special fiberoptic serial channels, which will make use of faster disk drives and controllers.

Most analysts believe the first step toward Summit will take place later this year when IBM introduces new disk drives and controllers. The consensus: the drives will employ triple-density technology and offer 7.5 gigabytes of capacity. IBM will ship the drives during the second half of the year, say analysts, because NAS and Amdahl are scoring with Japanese-made products that equal or beat IBM performance at a cheaper price.

Still, new disk drives and the first shipments of the 937X and PS/2 alone will not be enough to restore IBM to high growth rates. During the first quarter of this year, IBM's sales rose only 6 percent and its profits dropped 23 percent, compared with the same period in 1986. Yet many analysts found reason to rejoice, because the results were not as bad as they had predicted. "Relative to where they've come from, the first quarter wasn't so bad," says Djurdjevic. "But contrasted to others in the industry, where there is lots of good news for a change, IBM doesn't look very good." Djurdjevic and others say it won't be much different this year, but watch out for 1988. That's when observers expect all IBM's announced and yet-to-be announced products to come together to produce the first robust financial results in three years.

The message for MIS: Enjoy the ride while you can. Like all good things, this must come to an end. D